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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,243	03/25/2004	Kramadhati V. Ravi	ITL.1126US (P19032)	6714

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EXAMINER	
QUACH, TUAN N	

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/809,243	RAVI ET AL.	
	Examiner	Art Unit	
	Tuan Quach	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *1-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed May 26, 2005 has been received. Claims 1-17 remain withdrawn from consideration. Of the elected claims 18-28 for consideration in the previous Office action, claims 23-28 now are cancelled. The rejections of claims 23-28 accordingly are moot in view of the cancellation of these claims in said amendment. Pending claims 18-22 remain rejected for the reasons delineated below.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18,19, 20, 22 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0942072 ('072).

Regarding claims 18, 19, 20, 22, '072 teaches a semiconductor structure comprising a substrate a film, e.g., 81-83, containing significant amount of sp2 and sp3 bonded carbon, e.g., corresponding to diamond (sp3) and non-diamond form or graphite (sp2), [0013], [0026]. See the abstract, [0012], [0013], Fig. 8, [0036]. Note that the dielectric constant being less than 2 in claim 18 is anticipated in the range of less than 3; regarding claim 19, the porosity of 50 % is also anticipated, e.g., a range of 20% or greater.

Regarding claim 20, the metallic film such as wiring over the film e.g., layers 77, 79 is also shown.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over '072.

'072 is applied as above. Regarding the parameters in claims 18 and 19, it would have been further obvious and would have been within the purview of one skilled in the art to have selected and optimized the desired dielectric constant and porosity given the teachings of '072 delineated above and particularly at [0032] wherein the increased porosity and its assistance in lowering the dielectric constant is delineated.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over '072 taken with Matsubara et al.

Regarding 21, the use of metallic layer including copper would have been conventional and obvious as evidenced by Matsubara et al. 6,372,628 since such copper material for wiring is notoriously conventional as evidenced by Matsubara et al. column 16 line 45.

Applicant's arguments filed May 26, 2005 have been fully considered but they are not persuasive.

Initially, claim 18 is clearly anticipated by '072 teaches a semiconductor structure comprising a substrate a film, e.g., 81-83, containing significant amount of sp2 and sp3 bonded carbon, e.g., corresponding to diamond (sp3) and non-diamond form or graphite (sp2), [0013], [0026]. See the abstract, [0012], [0013], Fig. 8, [0036]. Note that the dielectric constant being less than 2 in claim 18 is anticipated in the range of less than 3 as delineated above. It remains applicable in view of applicant's failure to point out any patentable difference between the applied prior art and the claim.

Furthermore, contrary to applicant's argument, a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obvious. In addition, regarding the parameters in claims 18 and 19, it would have been further obvious and would have been within the purview of one skilled in the art to have selected and optimized the desired dielectric constant and porosity given the teachings of '072 delineated above and particularly at [0032] wherein the increased porosity and its assistance in lowering the dielectric constant is delineated. Applicant further alleges that the 50% porosity is not obvious. This however overlooked the teachings delineated above. The optimization of the result-

effective variable thus would have been a matter of routine optimization. It is well-settled that where the general conditions of the claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. It remains apparent to one skilled in the art that the introduction of porosity would contribute to lower dielectric constant and such optimization of a result-effective variable would have been a matter of routine optimization well within the purview of one skilled in the art. The evidence of obviousness and non-obviousness have been carefully considered, and it remains that the evidence of obviousness would clearly outweigh the evidence of non-obviousness.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Tuan Quach whose telephone number is 571-272-1717. The examiner can normally be reached on M-F from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Nathan Flynn, can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Quach
Primary Examiner